

## REPTILES OF SULU ARCHIPELAGO

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### THREE PLATES AND ELEVEN TEXT FIGURES

While on a fisheries exploration in Sulu Archipelago small collections of reptiles were made on several of the islands visited. As zoölogical collecting was only of secondary consideration on the trip, the attention that such collecting merited was not given to it. However, some specimens taken are new and are of much interest and importance. The known limits of distribution of several Philippine species were extended and many rare species and three species heretofore unknown to the Philippine fauna were found. The following species are described as new:

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| 1. <i>Luperosaurus joloensis</i> .       | 4. <i>Sphenomorphus biparietalis</i> . |
| 2. <i>Hemiphyllodactylus insularis</i> . | 5. <i>Brachymeles suluensis</i> .      |
| 3. <i>Lepidodactylus divergens</i> .     | 6. <i>Brachymeles vermis</i> .         |

The following species are here recorded for the first time from the Philippine Islands:

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|-----------------------------------|---|
| 1. <i>Mabuya rudis</i> Boulenger. | 3. <i>Lepidodactylus woodfordi</i> Boulenger. |
| 2. <i>Riopa bowringi</i> Günther. |   |

Of the forty-seven species here listed, four are known only from Mindanao and northern Philippine Islands; forty-three are found in the Sulu Archipelago and in Basilan. Of this number nineteen are common to Mindanao, Sulu, and Borneo; eight species are common to Mindanao and Sulu only; six are common to Borneo and Sulu, but are not known to occur in Mindanao; seven species are known only from Sulu; two are common to Sulu and other northern Philippine Islands, but as yet are not known from Mindanao; and one is common to Sulu and New Guinea. This tells but little regarding actual faunal relationships, as Mindanao, Borneo, and Sulu Archipelago have been but little explored zoölogically. Unfortunately very few specimens were taken or observed on the Sibutu Group of islands, which is the group nearest the Borneo coast. The collection made on the Borneo coast also was a very small one, reptiles, especially snakes, being rather rare. A planter living at Tunku Point told me he had seen only a single snake in two years' residence on his plantation.

## LIZARDS

*Gymnodactylus annulatus* Taylor. Text figs. 1 and 2.

This species was found to be especially common on nearly all the islands visited. Specimens were found under logs, rocks,

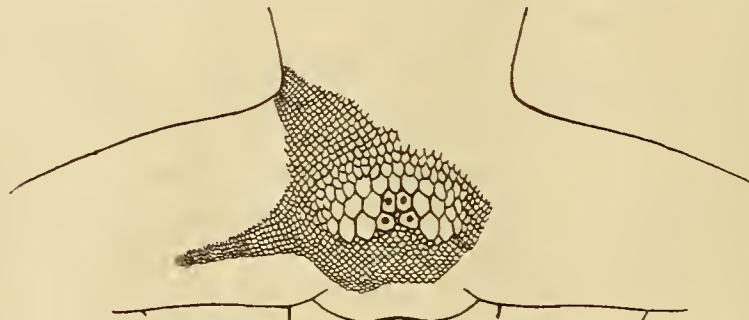


FIG. 1. *Gymnodactylus annulatus* Taylor, from Sulu, preanal pores, variation.  $\times 3$ .

rotten stumps, and in other similar habitats. These differ from the type specimen in having fewer preanal pores. There are three to five pores, four being the usual number. Slight differentiation was noted among specimens from different islands in the number, shape, and arrangement of the scales bordering the preanal pores. A very large series was preserved.

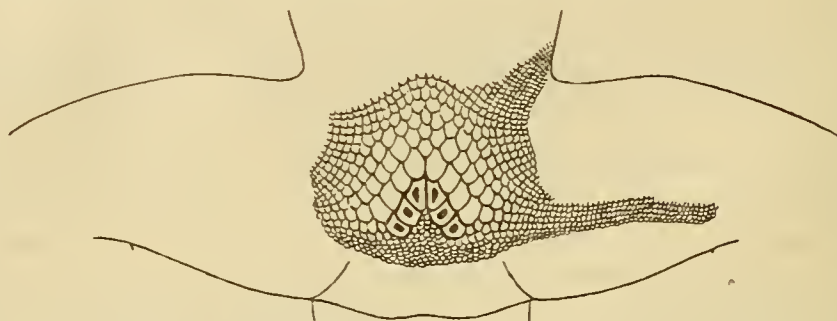


FIG. 2. *Gymnodactylus annulatus* Taylor, from Mindanao, preanal pores, typical.  $\times 3$ .

*Gekko gecko* Linnæus.

Specimens were taken on Jolo, at Siet Lake and Camp Roman-dier. A single specimen was obtained from Marongas Island near Jolo. Their unmistakable call was heard on several other islands, but no others were taken. The females have the preanal scales perforated, and they resemble the preanal pore scales of the males, save that the perforations are distinctly smaller.

*Gekko monarchus* Duméril and Bibron.

Two specimens were obtained on Bongao at an elevation of about 500 meters. They were found hiding under the loose bark of a tree, 3 meters from the ground. Both specimens are females

and are much darker than specimens from Mindanao. The white granules on the back form rather indistinct transverse lines. The median double row of black spots is present but dim, with some spots confluent.

*Cosymbotus platyurus* Schneider.

Specimens were taken in Zamboanga, Basilan, Bongao, Simonor, and Sitanki. The cutaneous expansion from axilla to groin is apparently wider in these than in specimens from Negros or Manila with which they were compared.

*Hemidactylus frenatus* Duméril and Bibron.

Very common throughout the Archipelago; numerous specimens were taken.

*Peropus mutilatus* Weigmann.

A very common forest species, present on nearly all the islands visited.

*Luperosaurus joloensis* sp. nov. Plate I, fig. 8; text fig. 3.

*Type*.—No. 1872, female, Bureau of Science collection; collected at Siet Lake, Jolo, September 22, 1917, by E. H. Taylor.

*Description of type*.—Snout squarish, the rostral upright, longer than broad, with two slight depressions in the upper part, entering from near the median internasal; nostril surrounded by a raised prominence consisting of rostral, first labial, a postnasal, and two supranasals; last three scales coequal; eleven upper labials, the last two very small, second and third larger than first; a row of slightly enlarged scales above the upper labials, those immediately behind the postnasal largest; mental almost triangular, differentiated from the labials; a pair of hexagonal chin-shields followed by a single median scale; eleven lower labials, last three very small; eighth upper and eighth lower labials below center of eye; two or three rows of scales bordering the lower labials slightly enlarged; forehead concave, the granules on the snout larger than those on back or occiput; ear opening narrow, oblique; granules on the side and on part of head and neck intermixed with numerous spinelike scales; no lateral fold, but several enlarged scales arranged in a more or less regular row from axilla to groin; a fold of skin present about legs, more prominent on the posterior aspect of hind legs; scales on belly larger than on throat or back; a row of enlarged scales in the femoral and preanal region, sixteen on each side beginning on the knee and meeting medially at a broad angle, some of the scales apparently perforated; behind



this row, in front of anus, an angular row of much enlarged scales; anus not covered by an angular flap of skin; tail contained in distance from snout to vent one and one-half times; tail tapering gradually, rather flattened below; the annulations distinctly marked above; laterally two spinelike scales on each annulation pointing backward; scales on upper side larger than those on back, the annulations marked by a transverse row of scales slightly more prominent than others; below, scales arranged in transverse rows, the annulations marked by a row of slightly larger scales; a single prominent scale below at the base of tail on either side; adpressed limbs meet; digits half-webbed; claws

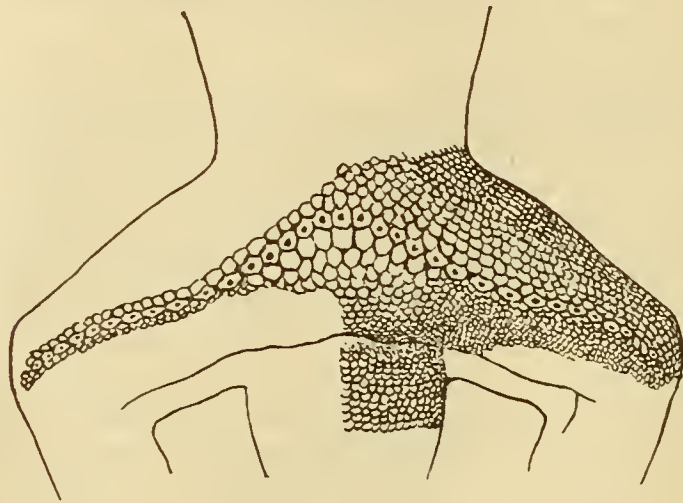


FIG. 3. *Luperosaurus joloensis* sp. nov., cotype from Jolo, preanal pores. About  $\times 4$ .

present on all save inner digits; lamellæ on outer extremities of digits divided, about six on longest toe, followed by a few undivided scalelike lamellæ; diameter of eye less than its distance from nostril or auricular opening.

*Color in life.*—Above russet brown, with indistinct grayish markings on side of snout, occiput, sides of neck, and across the back; below yellowish, mixed with flecks of brown. Tail indistinctly barred above; grayish brown below.

*Measurements of Luperosaurus joloensis* sp. nov.

	mm.
Total length	59
Snout to vent	36
Tail	23
Width of head	5.5
Length of head	10
Axilla to groin	17
Foreleg	10.5
Hind leg	14.7



*Variation*.—A second specimen captured in the same immediate locality is a male and consequently differs from the type (an adult female containing undeveloped eggs) in the presence of distinct femoral pores. There are thirty-one of these in a continuous series from knee to knee, forming a distinct arch in the preanal region. The tail is missing. The color is brown, with a wide occipital spot of gray and black mixed and five irregular bands across the back of gray and black intermixed. The length from snout to vent is 27 millimeters.

*Remarks*.—This species differs much from other known species of this genus. The presence of chin-shields, spiny scales on side of neck and head, the much fewer labials, and the large number and the arrangement of the femoral pores are all distinctive characters.

These two specimens were found at the base of a large tree under bark and small rocks. No other specimens were seen.

*Hemiphyllodactylus insularis* sp. nov. Plate I, figs. 6 and 7; text fig. 4.

*Type*.—No. 490, male, E. H. Taylor collection; collected at Sumagui, Mindoro, May 20, 1916, by E. H. Taylor.

*Description of type*.—Head oviform, much longer than broad, less than twice as high as wide; snout slightly longer than its distance from the auricular opening, one and one-half times the diameter of eye; eye large, pupil vertical; auricular opening small, irregular in shape; rostral much wider than high, subrectangular in shape, slightly notched above; nostril surrounded by the rostral, the first labial, and three nasals; the upper largest, separated from its fellow by two scales; eleven upper labials, last three minute; eleven lower labials; the mental triangular; no distinct chin-shields; scales bordering labials below, somewhat enlarged; granules on the snout distinctly larger than those on the back; latter minute, granular, equal; scales on belly cycloid, imbricate, larger than those on body above; no fold on body from axilla to groin; limbs rather small, failing to touch when adpressed; digits rather broad; the penultimate digit has two series of lamellæ, about four under the longest finger, followed by one or two paired scalelike lamellæ; longest toe with four lamellæ followed by two paired scales; a straight series of femoral pores on each side, ten on right, nine on left side, and a slightly angular series of eight preanal pores; tail cylindrical, tapering gradually.

*Color in life*.—General body color above light brown made up of varicolored scales—some brick red, whitish, black, brown,

and yellow; a series of brick-red dark-edged spots begins behind the eye and continues to tail; upper and lower labials dark, with a series of red spots along each jaw; pupil vertical, coppery red; belly and chin yellowish brown with numerous brown scales. Tail above with a large basal, red, black-edged spot; tail lighter with a dim series of paired lighter spots to the tip.

*Measurements of Hemiphyllodactylus insularis sp. nov.*

	mm.
Total length	56
Snout to vent	30
Tail	26
Head length	9
Head width	5
Foreleg	8
Hind leg	10.5
Axilla to groin	19

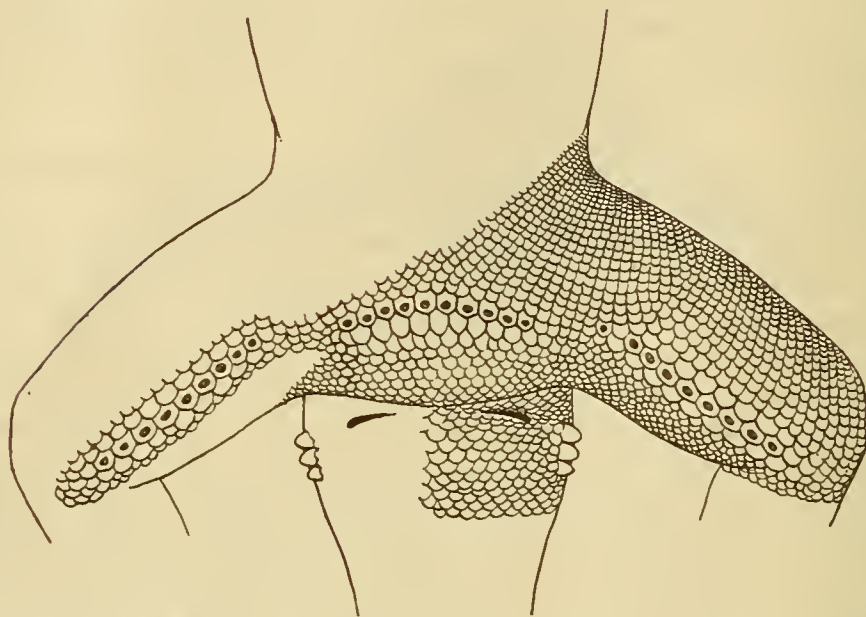


FIG. 4. *Hemiphyllodactylus insularis* sp. nov., type from Mindoro, preanal and femoral pores.  $\times 10$ .

*Variation.*—Very little variation is shown in the three other specimens taken in Mindoro. Five specimens taken in Jolo Archipelago are referred to this species. They are from the following localities: Cancuman, Dipolod, Marongas, and Bubuan (Tapiian Group). They differ somewhat among themselves and also from the type in color. Specimens from the first three localities are light gray with a distinct black streak passing above labials through the eye and with a second along the canthus rostralis also passing through the eye, meeting at a point at the base of head medially; back mottled with darker color; a distinct dark spot on the base of tail above; the light spots

(red in the type) are evident in these specimens. The first row of scales bordering the labials is slightly larger than in the type. One is a male with ten to twelve femoral pores and seven preanal pores.

The Bubuan specimen is dark brown with darker brown reticulations; a short orange line behind the eye and small orange spots on the sides; a light, dark-edged mark on the base of tail above, as in the type.

*Remarks.*—This species is very closely allied to *H. leucostictus* Stejneger, if actually distinct. I have no Hawaiian specimens, but Stejneger's excellent description and drawings of the type are at hand.<sup>1</sup> The following differences are evident: The anterior labials are larger, and the posterior smaller, than in *leucostictus*; the eye is nearer the ear opening than end of snout; lateral scales on tail not pointed and raised, the preanal pores in a curved instead of an angular line. There are two or (usually) three scales separating the supranasals. The specimens from Sulu Archipelago have the chin-shields slightly enlarged, and in one specimen a single large scale follows the mental. All of these specimens were found along the seashore under bark of trees exposed to sun and usually reached by the sea water at high tide. Two small eggs are laid. These are joined to each other and attached under the bark of trees. The eggs are rather dirty or brownish white; the undeveloped eggs in the females are brown.

*Lepidodactylus woodfordi* Boulenger. Plate I, figs. 4 and 5.

*Lepidodactylus woodfordi* Boulenger, Proc. Zool. Soc. London (1887), 334, Pl. 28, fig. 1; DE ROOIJ, Rept. Ind.-Aust. Arch. (1915), 1, 51.

*Description of species.*—(From No. 1541, Bureau of Science collection). Head oviform, with a broad shallow groove on snout; a distinct depression between nostrils; rostral bent back over point of snout, broadly entering the nostril, highest at the suture with internasal; nostril surrounded by rostral, first labial, a supranasal, and two postnasals; supranasals separated by a single large scale, with a pair of small scales on each side; ten to twelve upper labials; mental differentiated in shape, but not larger than adjacent labials; ten lower labials, the last two or three of both upper and lower labials, very small; largest chin-shields are four in number, one pair bordering the mental, the second immediately posterior to first pair (these scales are not equal, but vary in size); other scales touching these enlarged ones are smaller, rounding; granules on snout much larger than those on occiput

<sup>1</sup> *Proc. U. S. Nat. Mus.* (1899), 21, 800, figs. 7, 8, 9.



TABLE I.—*Specimens of Hemiphyllodactylus insularis sp. nov.*

No.	Locality.	Sex.	Snout to vent. mm.	Axilla to groin. mm.	Lamellæ under fourth toe.	Precanal pores.	Femoral pores.	Eye nearer ear than mouth.	Upper labials.	Lower labials.	Inter-nasals.	Collection.
490	Mindoro Island	♂	30	19	5	8	9-10	Yes	11	11-10	2	E. H. Taylor.
489	do	♀	32.3	17	4			do	10	10-11	2	Do.
491	do	♂	31	17	4	10	9-9	do	10	10-11	3	Do.
	do	♂	34	19	4	8	10-10	do	10-11	10-11	3	Do.
	Cancuman Island	♂	30	15	5	7	12-10	do	10-11	10-10	3	Bureau of Science.
	do	♀	34.2	18.5	4			do	12-12	12-12	3	Do.
	Dipolod Island	♀	36	20	5			do	11-10	11-11	3	Do.
	Marongas Island	♀	33.5	18.2	5			do	10-10	9-11	3	Do.
	Bubuan Island	♀	34	18.2	5			do	12-11	10-11	3	Do.

or body; scales on belly large, cycloid, imbricate; scales on the tail arranged in transverse series, larger below than above, all larger than those on body; annulations indistinctly marked by series of slightly enlarged scales; scales on regenerated portion of the tail irregular and no annulations marked; a continuous series of twenty-four preanal and femoral scales in the preanal region, forming an angle medially; limbs moderately long, meeting when adpressed; digits well developed; inner toe long, well developed, lacking terminal digit and claw; third and fourth toes nearly equal; digits widened at ends, rather slender proximally, only a slight trace of web present; nine lamellæ under inner toe, the first single, the four following divided, last four narrower, rather scalelike; twelve under fourth toe, first four divided followed by three broad undivided lamellæ, these in turn followed by five scalelike lamellæ on the proximal portion of digit, not extending to the base. Eye large, distinctly nearer ear than snout, its diameter about one and one-half times in its distance from snout; ear opening very small, somewhat larger than nostril; tail rather cylindrical, noticeably flattened above and below, with a slight medial depression above and below; no lateral fringe, but the scales on the outer edge slightly raised.

*Color in life.*—Above gray with variegated scales of brownish and black and six black, irregular, zigzag lines across the back with lighter color between them; one or two indistinct darker lines across the snout and a few dark markings on occiput; a distinct black line from the nostril through the eye, which continues above the ear to the foreleg; tail pinkish gray with a series of dim transverse darker bars and a row of median black spots; also lateral rows of spots; below nearly uniform yellowish cream; labials with lighter spots.

*Measurements of Lepidodactylus woodfordi Boulenger.*

	mm.
Total length	71
Snout to vent	35.5
Axilla to groin	17.5
Tail, tip regenerated	35.5
Length of head	9.5
Width of head	7
Foreleg	9.5
Hind leg	14.5

*Variation.*—The seventeen specimens at hand show comparatively little variation; the number of pores or pore scales varies between twenty-one and twenty-five, the average being twenty-three. Occasionally they form a broad angle medially, but

usually the series is curved; the two median scales are largest and frequently are slightly separated. Upper and lower labials vary between ten and twelve. The scales between the supranasals are usually reduced to one large circular scale (only four specimens show exception). The arrangement of the chin-shields is usually in two irregular curved rows, most of the enlarged scales are anterior to a line drawn from the posterior part of third labial across jaw. The regenerated tails have the scales arranged irregularly, the annulations not marked; the tail is much wider than deep in cross section. In color the specimens range from brown with rather heavy dark zigzag bars with lighter bars between to very light gray specimens with a few darker markings on back and no trace of zigzag lines; the young are dark laterally.

*Remarks.*—I have referred this group of specimens to Boulenger's species, since I can find no differences of any import between them and the published description and drawings of the type by Boulenger.<sup>2</sup> The color pattern shown on Boulenger's figure is almost identical with markings of living adult specimens taken. If the specimens are correctly identified, as I believe they are, they represent an interesting addition to our fauna. The nearest territory where they are known is New Guinea, the type locality being Faro Island, Solomon Islands.

TABLE II.—*Specimens of Lepidodactylus woodfordi Boulenger.*

No.	Locality.	Sex.	Snout to vent.	Head.		Axilla to groin.	Foreleg.	Hind leg.	Upper labials.	Lower labials.	Prenatal scales or pores.
				Length.	Width.						
			mm.	mm.	mm.	mm.	mm.	mm.			
1526	Santa Cruz Island....	♂	40	10	6.8	20	10.5	16.2	10	11-12	24
1527	.....do.....	♂	39	10	7.5	18	11.8	17	11	10	21
1529	Great Govenen Island	♀	41	10.2	7.3	21.2	11.5	16	11	11	22
1530	Bubuan Island.....	♀	40	10	7.1	20	12	16	10-11	11-12	23
1531	.....do.....	♀	37	10	7.2	19	11	15.6	12	11	25
1532	.....do.....	♂	38	10	7.2	20	11.2	15.4	11	11	23
1534	.....do.....	♂	40	10	7.5	20	12	17	12-12	11	24
1537	.....do.....	♀	36	9.2	6.3	19.1	10	14	10	10-11	24
1540	Dipolod Island.....	♂	35	9	7	17	11	15.5	11-10	12-10	22
1541	Sipayu Island.....	♀	35.5	9.5	7	17.5	9.8	14.5	10-12	10	24

*Lepidodactylus divergens* sp. nov. Plate I, figs. 1, 2, and 3.

*Type.*—No. 2026, female, Bureau of Science collection; collected on Great Govenen Island, 1917, by E. H. Taylor.

<sup>2</sup> Loc. cit. Boulenger states that his specimen has no distinct web, but his fig. 12 shows a distinct rudiment as is present in Sulu specimens.



*Description of type.*—Head elongate, oviform; snout rather flattened, with a median groove; rostral more than twice as wide as high, rather low medially above, but raised on each side in front of nostrils; latter surrounded by rostral, first labial, two supranasals, and a large postnasal; the supranasals bordering rostral separated by three equal-sized scales; twelve upper labials; a row of scales bordering upper labials above, somewhat enlarged; twelve lower labials; the mental longer but narrower than adjacent scales; a group of enlarged shields under point of chin, the three pairs following the mental largest; almost all enlarged scales are anterior to a line drawn across chin from the sutures between fourth and fifth labials; granules on throat small, about equal to those on occiput and somewhat irregular in size; scales on belly cycloid, imbricate; in the preanal region a long series of preanal scales angular medially; tail much wider than deep, rounding above, noticeably narrowed at the base; flattened below with indications of a slightly sharp, dimly serrated lateral edge, the scales arranged in transverse rows, those above much smaller than those below, the annulations only dimly marked; limbs fairly well developed; digits well developed, except inner, which lacks the distal phalanx and claw; digits slightly wider distally; about ten lamellæ under inner toe, the outer single, the five following divided by a median suture; fifteen under fourth toe, five outer divided; diameter of eye contained in distance from eye to snout two and one-fifth times; eye to ear much less than distance from eye to end of snout.

*Color in life.*—Above russet to darker brown with numerous darker, narrow, zigzag lines, nine or ten from occiput to base of tail, with lighter areas between them, broad darker bands on tail, about eight to tip; a dark brown line from nostril through eye, which broadens slightly and continues some distance on neck; a yellow line above the brown, quite distinct behind eye; a row of yellow spots dorsolaterally from neck to base of tail; a few yellow flecks laterally; below yellowish, speckled with brown; variegated reddish brown on underside of tail.

*Measurements of Lepidodactylus divergens sp. nov.*

	mm.
Total length	80
Snout to foreleg	16.5
Snout to vent	41.5
Tail	38.5
Axilla to groin	20
Width of head	7.3
Length of head	12
Foreleg	11.2
Hind leg	16.2

*Variations.*—Table III shows clearly the variations in a series of nearly equal-sized specimens. Twenty-five specimens were taken, and all are females. All except two were taken on Little Govenen Island.<sup>3</sup> These all showed the characteristic zigzag markings, and usually three short longitudinal dark stripes were present between the shoulders; the series of yellow spots were present on all specimens taken; the three scales between the supranasals are frequently replaced by a single large scale; there is also variation in the arrangement of the chin-shields, but the three pairs following the mental are usually largest. There is slight variation in the length of the snout; sometimes the diameter of eye is contained in the eye to snout distance less than two times. Regenerated tails are flatter and have a sharper, more prominent, serrated edge than normal specimens.

*Remarks.*—Not a single male specimen was found.<sup>4</sup> This is especially surprising in view of the fact that so large a series was taken and in such a restricted locality. No explanation seems possible save that the males have different habits from the females and occupy some habitat that could not be discovered. All specimens seen were captured, so it could not be explained by their greater agility in escaping capture. This is another species "closely allied to *L. lugubris*," but differs from it in several points. There is a much larger series of preanal scales (pores in males?); there are nearly twice as many lamellæ under the fourth toe (fifteen in the type). The color pattern is distinctly different; the body is crossed by the series of zigzag lines instead of having two median rows of spots present; there is invariably present a series of small yellow spots dorsolaterally on the body. A comparison of descriptions shows other differences.

<sup>3</sup> Little Govenen is an extremely small island lying less than a kilometer from the southwest coast of Basilan Island. It contains only a few hundred square meters of land and rises to an elevation of about 15 meters. On my first visit twelve specimens of this species were taken on the bare rocks that jut from one side of the island. All of these, apparently, were females, and later a special trip was made to the island for the purpose of discovering the males. On this trip the entire island was searched, and eleven specimens were taken. These, too, were females. Later two more specimens were found on Bubuan Island and these also were females.

Many of the specimens contained partly developed eggs, and the sex of these could not be questioned; certain specimens were dissected by myself and others by Dr. E. S. Ruth, of the University of the Philippines, who pronounced all of them females.

<sup>4</sup> In this connection one notes that of fifteen specimens of *Lepidodactylus lugubris* listed by Boulenger [*Cat. Liz. Brit. Mus.* (1885), 1, 165-166] only one is a male.

TABLE III.—*Specimens of Lepidodactylus divergens* sp. nov. in the Bureau of Science collection.

No.	Locality.	Sex.	Snout to vent.	Head.		Axilla to groin.	Fore-leg.	Hind leg.	Labials.		Pre-anal scales.
				Length.	Width.				Upper.	Lower.	
			mm.	mm.	mm.	mm.	mm.	mm.			
1542	Great Govenen Is-land.....	♀	40	11	7	17.3	12.2	16	11-12	11-12	33
1543	do.....	♀	42.5	12	7	20.8	13	15.6	12-13	11-12	33
1545	do.....	♀	43.5	12.2	7.8	22	12.5	16.2	11-12	11-13	32
1544	do.....	♀	43	12	7.2	20.2	14.5	17	12	12	35
1546	do.....	♀	44	12.2	7.3	22.6	13.2	17	12-13	12	33
1547	do.....	♀	42	11.5	7	22.2	12.2	17.5	12	12	32
1548	do.....	♀	40	11.8	7	21.8	12	16.3	12	11-12	33
1549	do.....	♀	43.8	12	7.8	22.8	13	17.2	12	12-13	32
1550	do.....	♀	41	11.5	7.1	20.8	12.5	16.5	12	11	32
1551	do.....	♀	40	11.3	7.2	19.8	12	15.1	12	11	34
1554a	do.....	♀	41.5	12	7.3	20	11.2	16.2	11-12	11-12	34

\* Type specimen.

Draco rizali Wandollek.<sup>5</sup> Plate II, figs. 3 and 4.

I have referred to this species the common *Draco* of Zamboanga and certain islands to the south.<sup>6</sup> Males and females differ greatly in color. I append color descriptions of both sexes.

*Female*.—Metallic iridescent gray with dim narrow blackish brown reticulations, sometimes forming dim brownish bands across the back; a few indistinct whitish spots laterally; a large nuchal spot usually present, an interorbital dark spot, and dark markings or reticulations on side of head; shoulders with or without a greenish wash; tail gray to brown with broad fairly distinct bars of darker brown; belly cream-white reticulated with darker color; throat and chin reticulated with bluish. Wing membranes above, black slightly washed with gray, inclosing bright reddish to orange spots, lighter next the body and of deeper color near outer border; below light, with a light wash of yellow and several small black spots near upper and outer border.

*Male*.—Brilliant yellow-green, somewhat metallic, with occa-

<sup>5</sup> The type was collected by Dr. Jose Rizal in Dapitan and was sent to the Dresden Museum together with other herpetological material. It was named for him by Wandollek.

<sup>6</sup> I have not compared these with the type, but with a splendid photograph of the type taken by Professor Austin Craig, the plate of which is deposited in the Philippine Library. I was permitted to have prints made through the kindness of Professor Craig.



sional scales of lighter and darker color. Wing membranes darker with numerous (usually) roundish spots of bluish to yellowish green, the outer edge light salmon washed with gray. Head with the interorbital dark spot; the nuchal spot absent; dark markings either present or absent on the sides of the head. Below, belly and wing membranes salmon to brick-red, usually with only one large or small dark spot in the outer margin of wing; gular appendage canary yellow at tip, the remainder bright purple to wine color with a green wash at base; throat and chin with darker reticulations; belly with very dim reticulations of darker color either present or absent.

The males can make extremely rapid changes of color. They change from light to dark green, then to black or reddish brown in less than a minute and vice versa. When the brown specimens are placed in alcohol, the green returns largely and when fixed is blue green to blue, the salmon largely disappearing below. In consequence of the color changes the head markings vary considerably in preserved specimens.

The species was abundant in the coconut groves near the mountains in Zamboanga. Specimens were also taken on Bongao and Simonor. On the latter island they were especially numerous in the coconut trees. With the aid of the Samals a large series was collected in the village of Tubig Indangan. The species was seen in Jolo, but no specimens were acquired.

*Draco bimaculatus* Günther. Plate II, figs. 1 and 2.

A single specimen was obtained in the mountains near Zamboanga (city). It is the smallest species of the genus found in the Islands. It was also observed in Tawitawi. The paper-white gular appendage and the slender body render it easily identified at a considerable distance.

*Draco cornutus* Günther.

This species has been reported from Jolo by Werner.<sup>7</sup> I failed to find it there.

*Mabuya multifasciata* Gray.

Specimens were taken in Zamboanga, Bubuan (Tapiantana Group), Jolo, Bubuan (Tapiantana Group), Papahag, and Bongao. Specimens from the last two localities have a broad brilliant brick-red stripe beginning behind the eye and continuing some distance along the side. It is present in both sexes. Those found on the other islands sometimes have an orange or light spot laterally, but it is absent in females.

<sup>7</sup> *Mitt. Natur. Mus. Hamb.* (1910), 27 (2), 9.

*Mabuya multicarinata* Gray.

Taken at Zamboanga, Santa Cruz, Basilan, Great Govenen, Bubuan (Tapiantana Group), Dipolod, Bitinan, Jolo, Bubuan (Tapian Group), Bongao, Papahag, and Simonor. I am certain that I observed this species in Sitanki and on the coast of British North Borneo, near Tunku Point. These southern specimens differ but little from those in the more northern Philippine Islands, save that the scale rows are thirty-two to thirty-four, while the usual counts are twenty-eight to thirty in northern specimens.

*Mabuya rudis* Boulenger. Text fig. 5.

*Mabuia rudis* Boulenger, Cat. Liz. Brit. Mus. (1887), 3, 188, Plate 11, fig. 3; DE ROOIJ, Rept. Ind.-Aus. Arch. (1915), 1, 161.

*Mabuia lewisi* BARTLETT, Crocod. Liz. Borneo (1895), 93.

This is the first record of this species for the Philippines. In consequence, I have appended a description of it.

*Description of species.*—(No. 344, Bureau of Science collection; Papahag Island). Rostral rather small, wider than high, well visible above, slightly in contact with the frontonasal; internasal present, small, elongate, not in contact; frontonasal slightly broader than deep, in contact with the frontal behind; prefrontals rather large, separated, touching first and second supra-oculars; frontal narrow, elongate, not as wide as the supra-ocular region, much longer than the distance to end of snout, and longer than the parietal region; frontoparietals distinct, rather elongate, longer than the interparietal; parietals wider than long, not forming a suture behind the interparietal; a pair of large nuchals; four supra-oculars, the first much reduced, not touching the frontal; second very large, the only supra-ocular touching the frontal; nostril in a rectangular nasal pierced behind the vertical of suture of rostral and first labial; a postnasal; two frenals, the anterior much higher than the nasal, much smaller than second; two preoculars between first superciliary and the fourth labial, superior small; four labials anterior to large subocular; six lower labials, first small, third much elongate; mental narrow, followed by a postmental and two pairs of divided chin-shields, first pair in contact; temporals not or but slightly enlarged; six superciliaries, the first and third much the largest; lower eyelid scaly; ear moderate, tympanum deeply sunk, lobules projecting; scales in thirty rows around the body all keeled except the ten ventral; head scales somewhat rugose. Legs well developed, the adpressed hind limb reaches slightly beyond the

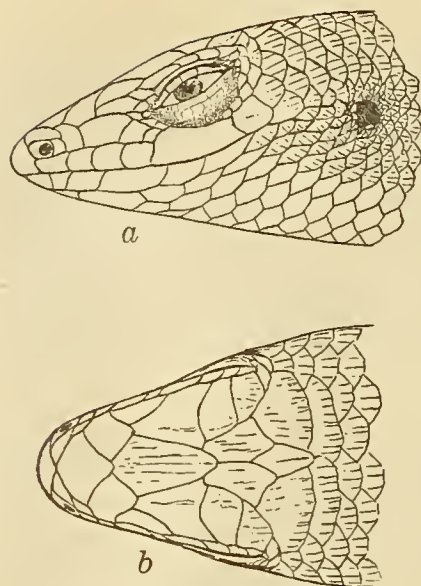


FIG. 5. *Mabuya rudis* Boulenger, from Sulu; a, side of head; b, top of head.  $\times 2$ .

shoulder; fourth toe much longer than third with twenty unicarinate lamellæ below. Anals not or but slightly enlarged; tail long, somewhat compressed, tapering very quickly behind anus; eye nearer the ear than end of snout; ear much nearer the foreleg than end of snout.

*Color in life.*—Above, head and body dark brown with some scales flecked with black; below, throat and chin bluish with black flecks, belly yellowish with black spots on many of the scales; underside of legs and base of tail grayish brown.

*Measurements of Mabuya rudis Boulenger.*

	mm.
Total length	229
Snout to vent	93
Snout to foreleg	34
Tail	136
Axilla to groin	44
Width of head	15
Length of head	22
Foreleg	35
Hind leg	50

*Variations.*—Two other specimens have been captured: one, an adult from Tawitawi; the other, a young example from Papahag. The first specimen does not differ from the described specimen save that the black spots on the back form continuous dotted lines, and there is a bright orange band along the side (greenish in alcohol). Throat bluish with indistinct bluish longitudinal lines; labials with black spots; tail flecked with white. The young specimen is olive green, with a broad black stripe beginning behind the eye; sides of neck and body greenish; below greenish white. De Rooij, (op. cit.) states that the range of scale rows is between thirty and thirty-six.

*Remarks.*—This species was first observed on Bitinan, a small island near Jolo, Sulu Archipelago. It was also observed on Jolo and on most of the islands visited to the south. The first specimen was taken on Tawitawi. It appears to be very common, but is extremely difficult to capture. It does not replace



either of the other species of *Mabuya*, *multicarinata* or *multifasciata*, since the three occur with the same apparent frequency on the islands from Bitinan to Sibutu Channel. I did not observe any of the three species on the Sibutu Group between Sibutu and Alice Channels, but I do not doubt that they are present, since the three species are known to occur in Borneo. Many of the specimens seen showed the anterior part of the body bright russet to orange; in others the orange was only present low on the sides of the body. It is extremely elusive, and specimens shot with an air rifle usually managed to escape. Unlike *M. multicarinata* and similar to *M. multifasciata* it takes refuge in holes in the ground, which are probably burrows made by it. It occurs in Sumatra, Java, Borneo, and Celebes. In the Philippines it is known only from Sulu Archipelago.

*Sphenomorphus fasciatus* Gray.

Several specimens were taken in Zamboanga and on Teipono Island. In both places they were found burrowing under logs.

*Sphenomorphus variegatus* Peters.

Specimens were obtained in Zamboanga and on Bubuan (Tapiantana Group), Bitinan, Jolo, Sangasanga, Tawitawi, and Bongao.

*Sphenomorphus palustris* Taylor. Text fig. 6.

Specimens were taken at Zamboanga and on Great Govenen and Bubuan (Tapiantana Group) Islands, but none was taken or observed farther south. It was present on the two islands named in large numbers. All have forty scale rows around the body and the distinct black and cream stripes on the side of head; the limbs have narrow light stripes on a blackish brown ground color. The hind limbs are almost black in adults. There are numerous transverse rows of light scales on the sides with black areas between them.

*Sphenomorphus biparietalis* sp. nov. Text fig. 7.

*Type*.—No. 1991, E. H. T. collection; collected on Lapac, Sulu Archipelago, September 28, 1917, by E. H. Taylor.

*Description of type*.—Head short; snout truncate; the rostral rather small, forming a broad straight suture with the fronto-nasal; latter wider than deep, minutely in contact with the frontal; prefrontals large, barely separated, touching minutely the first supra-ocular; frontal much longer than broad, scarcely as wide as the supra-ocular region, in contact with two supra-oculars; frontoparietals large, distinct, touching three supra-

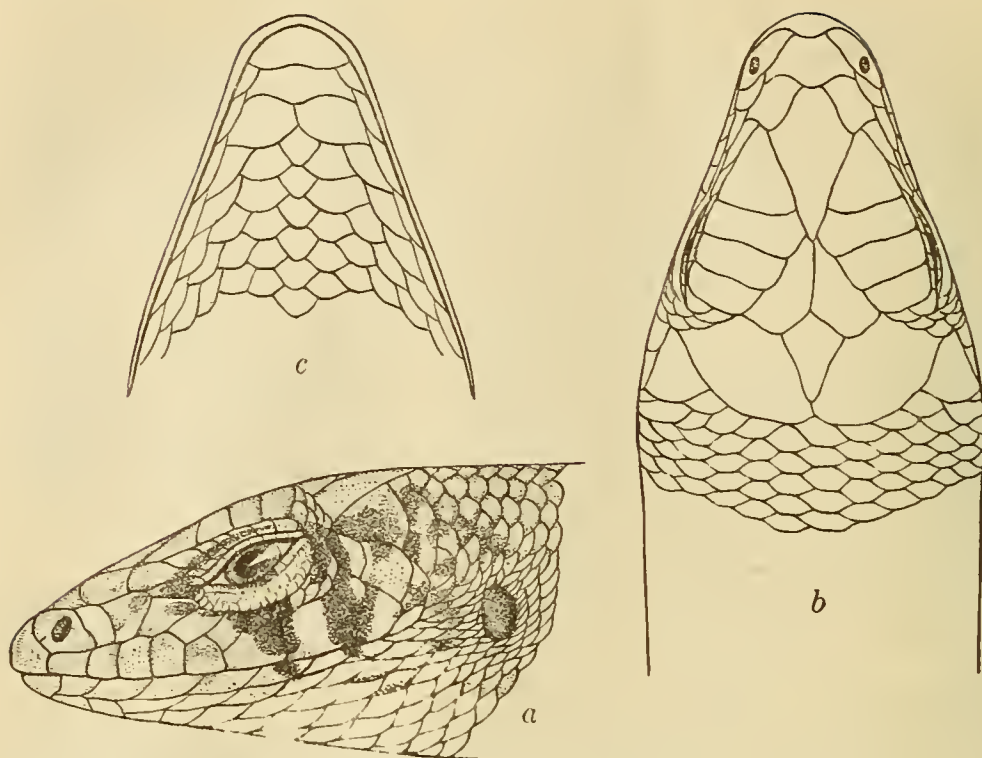


FIG. 6. *Sphenomorphus palustris* Taylor, from Sulu; a, side of head; b, top of head; c, chin.  $\times 3$ .

oculars; interparietal small, longer than wide, parietals nearly rectangular, broadly in contact with each other behind the interparietal; a second pair of parietals between the first pair and the last supra-ocular, this pair much smaller, in contact with the frontoparietals, the last supra-ocular, and one or two small temporals; no nuchals; nostril pierced in a single nasal; nasal followed by one frenal; the latter followed by two pre-

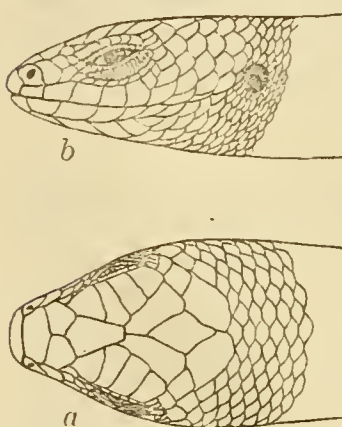


FIG. 7. *Sphenomorphus biparietalis* sp. nov., from Sulu; a, top of head; b, side of head.  $\times 4$ .

oculars between first superciliary and second labial; the lower largest; behind this a row of seven subequal scales separating the labials from the orbit; six upper labials, the third, fourth, and fifth below the eye; six lower labials; the temporals slightly enlarged; mental small, followed by a broad postmental; two pairs of chin-shields, both broad, first pair in contact broadly; ear opening large, round, tympanum not deeply sunk; limbs weak, failing to meet when adpressed by a considerable dis-

tance; thirty-two scale rows around body, those on belly largest, lateral rows in straight longitudinal lines; preanal scales not enlarged; third and fourth toes almost of equal length, ten smooth lamellæ under each; scales on underside of tail not enlarged; ear much nearer the foreleg than end of snout.

*Color in life.*—Above brownish, many of the scales flecked with whitish; a more or less distinct light-dotted line from behind eye along side; below this a stripe of slightly darker brown flecked with white; belly cream, underside of tail flecked with brown; upper and lower labials with light spots.

*Measurements of Sphenomorphus biparietalis sp. nov.*

	mm.
Total length	70
Snout to vent	35
Snout to foreleg	11.5
Tail	35
Axilla to groin	21
Width of head	5
Foreleg	8
Hind leg	11

*Variations.*—Eleven other specimens are at hand for comparison. They are from various localities in the Archipelago, distributed as follows: Basilan, 1; Jolo, 4; Lapac, 2; Tawitawi, 1; Sangasanga, 1; Papahag, 2; Bongao, 1. The Basilan specimen is darker and is more heavily built; the head slightly broader, and scales in thirty-six rows about body; the prefrontals are broadly in contact; throat with black spots; two frenals present on right side. Specimens from Jolo are lighter, the two lateral light lines being more or less distinct. The type is from Lapac. Specimens from the more southern part of the Archipelago vary from thirty to thirty-four scale rows about the body. The labials vary between five and six.

*Remarks.*—This species seems to be very clearly differentiated by the arrangement of the parietals, which is different from that of any other species in the Islands. The only lizard in which this condition is approached is *Brachymeles vermis* Taylor, found on Papahag, near Tawitawi.

*Riopa bowringi* Günther. Text fig. 8.

*Eumeces bowringii* GÜNTHER, Rept. Brit. Ind. (1864), 91.

*Euprepes (Riopa) punctatostriatus* PETERS, Mon. Berl. Ak. (1871), 31.

*Lygosoma bowringii* BOULENGER, Cat. Liz. Brit. Mus. (1887), 3, 308;

Plate 23, fig. 3; DE ROOIJ, Rept. Ind.-Aus. Arch. (1915), 1, 264.

*Lygosoma whiteheadi* MOCQUARD, Le Natural. (1890), 12, 144; and

Nouv. Arch. Mus. (1890) (3), 2, 134, Plate 8, fig. 3.



*Description of species.*—(No. 1990, Bureau of Science collection; collected at Siet Lake, Jolo, September 22, 1917, by E. H. Taylor). Snout rather obtuse, the rostral slightly visible above; supranasals present, in contact behind rostral; frontonasal much broader than long, broadly in contact with the frontal; prefrontals present, very small and very widely separated, leaving the frontal in contact broadly with the frontonasal; frontal longer than broad, as long as interparietal and frontoparietal; parietals in contact behind the latter; a pair of nuchals, and a large temporal borders the parietals; nostril pierced in a rectangular nasal, followed by two frenals, the anterior higher than the nasal and the posterior frenal; two preoculars between the first superciliary and fourth labial; seven superciliaries; four

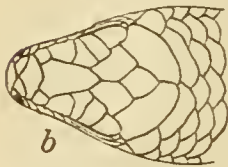
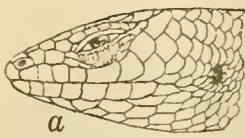


FIG. 8. *Riopa bowringi*  
Günther, from Jolo; a,  
side of head; b, top of  
head.  $\times 3$ .

supra-oculars, the first broadly in contact with the prefrontal; lower eyelid scaly; seven upper labials, the fifth large, below the eye; fourth as small as first; three or four enlarged temporals; six lower labials; mental rather wide, followed by a wide postmental; three pairs of divided chin-shields, the first pair in contact, the third small; ear opening small, with two projecting lobules; twenty-six rows of scales about middle of body, all smooth; preanal scales somewhat enlarged; scales on underside of tail slightly larger than those above; limbs rather small, the fourth toe only a little longer than third; thirteen lamellæ under fourth toe; tail thick, tapering very gradually. Eye nearer the end of snout than ear; the latter nearer the insertion of the foreleg than end of snout; adpressed limbs fail to meet by a considerable distance.

*Color in life.*—Above yellowish to dark brown, the scales on each dorsal row with black spots, forming more or less regular longitudinal dark lines; a broad black line begins behind the eye and continues above limbs to some distance on tail; scale row above black line, lighter than ground color; below black line, indistinct lines of brown with numerous distinct yellow punctations and occasional reddish brown scales; below orange to pink; rather pinkish in groin; a distinct white line along the upper labials.

*Measurements of Riopa bowringi Günther.*

	mm.
Total length (extreme tip of tail regenerated)	84.5
Snout to vent	42
Snout to foreleg	15
Axilla to groin	25
Tail	41.5
Width of head	5.1
Length of head	7.2
Foreleg	10
Hind leg	12.7

*Variations.*—Five other specimens from Jolo Archipelago are in the collection. They agree with the above description with few exceptions. One specimen has two pairs of nuchals, a second has the frontoparietals fused. All save the one described have twenty-eight scale rows. A young specimen in the collection is olive brown above. None of the specimens show evidence of carinations on scales.

*Remarks.*—This is the first record of this species from the Philippines. Its occurrence is hardly a matter of surprise, since de Rooij has identified Mocquard's *Lygosoma whiteheadi* from North Borneo as a synonym of this species.

The specimens obtained in Jolo Archipelago are from the following islands: Siet Lake, Jolo, 2 specimens; Lapac, 1; Bongao, 1; Simonor, 1; Tawitawi, 1. This species is also known from Borneo, several localities; Java; Celebes; Malacca; Siam; Burma; Hongkong.

*Emoia atrocostatum* Lesson.

It was observed or taken on all the islands visited; especially common along the coasts; numerous specimens were preserved.

*Emoia cyanurum* Lesson.

This species was taken only on Tulian, a small uninhabited rocky island near Jolo. It was not observed elsewhere. In the Philippines it is common on certain islands along the coast of Palawan. It is a matter of no small surprise that it was not taken or observed on the other Sulu Islands. If it is present, it is probably rare. Two of the specimens taken have brilliant blue tails with three greenish golden stripes on the back from snout to tail.

*Dasia smaragdinum* Lesson. Plate III.

Specimens were taken on Great Govenen and Bongao Islands. In the first locality they were especially numerous. Dorsally

the specimens are bluish green, anteriorly with many irregular dark spots mixed with small black spots and many smaller flecks; posteriorly the ground color is olive green to brown, the spots rather disappearing or uniting to form larger more regular spots; tail greenish.

The specimens from Bongao are olive to brownish green above with large black spots on the back of the head and many quadrangular black spots on the back with similar greenish white spots; tail olive gray with annulations dimly marked with whitish spots. Neither of these forms can be placed with the color varieties described and admirably figured by Barbour.<sup>8</sup>

*Tropidophorus rivularis* Taylor.

A number of specimens were taken near Zamboanga. They agree with the type, except that the interparietal is not divided.<sup>9</sup> I did not find this species in Sulu Archipelago. It is highly probable that this or a related species does occur on those islands that have running water. Species of this genus are constantly found along small fresh-water streams, usually under partly submerged rocks or logs.

*Brachymeles suluensis* sp. nov. Text fig. 9.

*Type*.—No. 1989, female, Bureau of Science collection; collected on Bubuan Island,<sup>10</sup> Tapiantana Group, Sulu, by E. H. Taylor.

*Description of type*.—Snout blunt, rather flattened; rostral bent back over end of snout, forming a moderate suture with the frontonasal; the latter longer than broad; prefrontals narrowly in contact, wider than deep, touching both frenals, first superciliary, and first supra-ocular; frontal large, a little longer than broad, in contact with two supra-oculars, narrowly in contact with the interparietal; the latter little longer than wide, much larger than the frontoparietals; parietals elongate, narrowly in contact behind the interparietal; no nuchals; nostril pierced in a minute nasal, followed by a small postnasal; anterior frenal nearly twice as large as the second; a small pre-ocular between the first superciliary and the third labial; five supra-oculars, second largest and widest; five or six superciliaries; six upper labials, first largest, fourth below eye; two small scales above the fifth labial; mental deeper than postmental, but not as wide; three pairs of chin-shields, the first

<sup>8</sup> *Mem. Mus. Comp. Zool.* (1912), 44, Pls. 1 and 2.

<sup>9</sup> Probably anomalous in the type.

<sup>10</sup> There are two islands in Sulu Archipelago by this name, one is in the Tapiantana Group, the second lies to the south in the Tapan Group.



pair in contact; second pair widest, separated by a single scale; third pair separated by three scales; ear opening minute, nearer end of snout than foreleg; twenty-four rows of smooth scales around body; preanals slightly enlarged; limbs pentadactyl, the anterior very short, reaching little more than halfway to ear; three scales above longest finger; five above longest toe; third and fourth toes subequal in length. Hind leg contained in axilla to groin distance five times.

*Color in life.*—Above and below light brown, each scale with a large slightly darker spot; a lighter stripe from behind eye to hind leg.

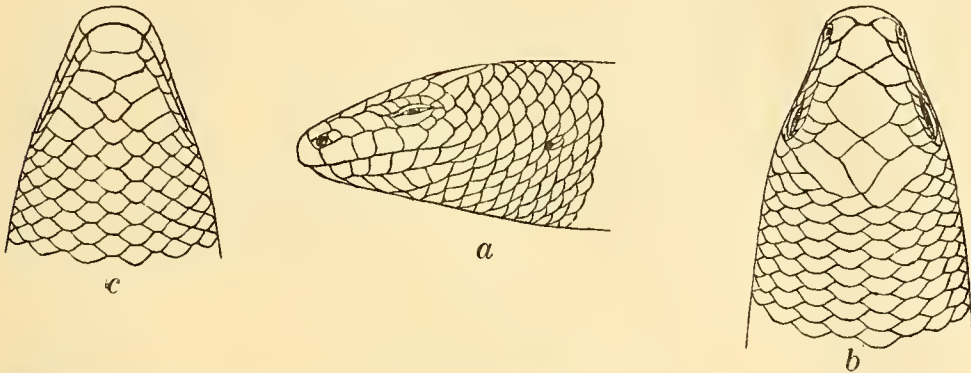


FIG. 9. *Brachymeles suluensis* sp. nov. Type from Bubuan; a, side of head; b, top of head; c, chin.  $\times 3$ .

*Measurements of Brachymeles suluensis* sp. nov.

	mm.
Total length	117
Snout to vent	81
Snout to foreleg	19
Tail, broken	36
Axilla to groin	55
Width of head	6.3
Foreleg	6
Hind leg	11

*Remarks.*—Only the type was found; it is an adult female containing embryos. This species forms another link in the chain of retrogression in the genus *Brachymeles*. It is between *Brachymeles schadenbergii* and *B. bicolor* and differs from both in the degree of development of the limbs and the relative length of the body.

*Brachymeles vermis* sp. nov. Text fig. 10.

*Type.*—No. 1980, Bureau of Science collection; collected at Bubuan, Tapanian Group, Sulu, October 1, 1917, by E. H. Taylor.

*Description of type.*—Rostral about as high as wide, bending back over point of snout, visible above by more than half its

height; frontonasal broader than deep, broadly in contact with the rostral, narrowly with the frontal; prefrontal wider than long, narrowly separated, touching two frenals, first superciliary, and first supra-ocular; frontal slightly longer than wide, in contact with two supra-oculars and the interparietal; the latter longer than broad, inclosed by the parietals, with a prominent eyespot, larger than frontoparietals; latter separated, touching two supra-oculars; a pair of nuchals present; parietals more than three times as long as wide; five supra-oculars, first largest, second widest, last three touching the parietal; nostril pierced between the large supranasal and first labial (if a nasal scale is present it is apparently indistinguishable); two frenals, first nearly twice as large as the second; one large preocular; only two anterior superciliaries distinguishable; six upper labials, first very large, third and fourth below the eye; a scale partially inserted between the fourth and fifth labials; mental large, extending back to the vertical of near suture between first and second upper labials; four lower labials; postmental smaller than mental, touching one labial; three pairs of chin-shields,

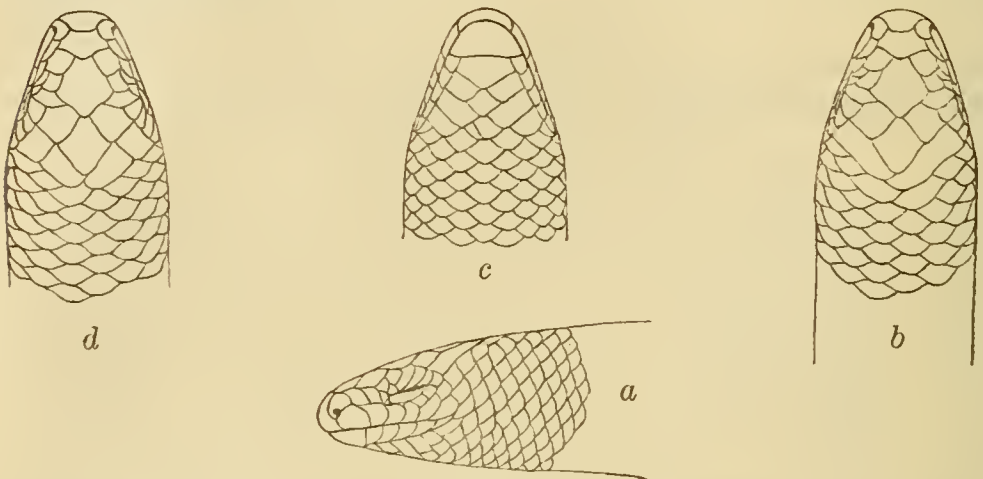


FIG. 10. *Brachymeles vermis* sp. nov., from Sulu; a, side of head; b, top of head (normal); c, chin; d, top of head (variation of Papahag specimens).

none in contact, second pair broadest, first two separated by a single scale, third pair by three scales; temporals slightly enlarged, two touching parietal; twenty-two scale rows around body, all smooth; preanals slightly enlarged. No limbs present; a slight depression laterally on either side of the anus with two or three elongate scales. No auricular opening; scales on anterior part of snout thickened.

*Color in life.*—Above light brown, each scale with a darker brown spot, making broken longitudinal lines; belly the same, slightly lighter.

*Measurements of Brachymeles vermis sp. nov.*

	mm.
Total length	144
Snout to vent	86
Tail	58
Width of head	4
Width of body	5

*Variation.*—Specimens were obtained in four localities: Bitinan, 3 specimens; Lapac, 4; Bubuan (south island), 3; and Papahag, 4. All show variations. Bitinan specimens have twenty-four rows of scales, and two have the nuchals much elongated and only one temporal touching the parietal; Lapac specimens have twenty-six scale rows; one specimen has the parietal broken on one side; Bubuan specimens, including the type, twenty-two scale rows; Papahag specimens all have the parietal broken in two parts. The first pair is small, about the size of the prefrontals; the second posterior pair elongate, forming the normal suture; they have twenty-two to twenty-four scale rows about the body.

*Remarks.*—This species is closely related to *Brachymeles burksi* Taylor and *Brachymeles bonitæ* Gray. It carries the retrogression of the genus another step, and we find the evolution complete from the highest developed forms, *Brachymeles gracilis* and *schadenbergii*, with well-developed pentadactyl limb, to this small legless form.

*Brachymeles gracilis* Fischer.

One specimen was obtained on Great Govenen Island and three specimens on Jolo Island. They agree very well with those from Negros and Mindoro. The hind leg is contained in the axilla to groin distance an average of three and one-tenth times; the development of the digits is slightly less than in northern specimens. It is a matter of no small surprise to find this species in Sulu Archipelago, as the known Mindanao species is *B. schadenbergii*.

*Dibamus argenteus* Taylor.

One specimen taken on Papahag; a second specimen was found at Tunku Point, British North Borneo.

## SNAKES

*Typhlops braminus* Daudin.

Specimens were taken at Zamboanga and on Bongao.

*Typhlops suluensis* sp. nov. . Text fig. 11.

*Type.*—No. 2001, Bureau of Science collection; collected on Bubuan, Tapian Group, Sulu, October 2, 1917, by E. H. Taylor.



*Description of type.*—Snout rather pointed, with a moderately sharp edge; rostral nearly one-half the width of the head, rather truncate behind, forming a broad straight suture with the prefrontal; the latter very large, broadly triangular in shape, its longest sutures with the preoculars; frontal very small, bordered by six scales, about one-fifth the size of the prefrontal; interparietal as wide as the prefrontal, but somewhat smaller; supra-ocular slender, about two and one-half times as long as broad; parietals much larger than supra-oculars, little more than twice as long as wide; nasals separated, their upper ends barely extending beyond the posterior level of the rostral, which reaches almost to the anterior level of the eyes; nasal completely divided by the nasal cleft, which arises from the first labial; preocular in contact with two labials, not as wide as the ocular, its upper end scarcely reaching higher than the upper level of

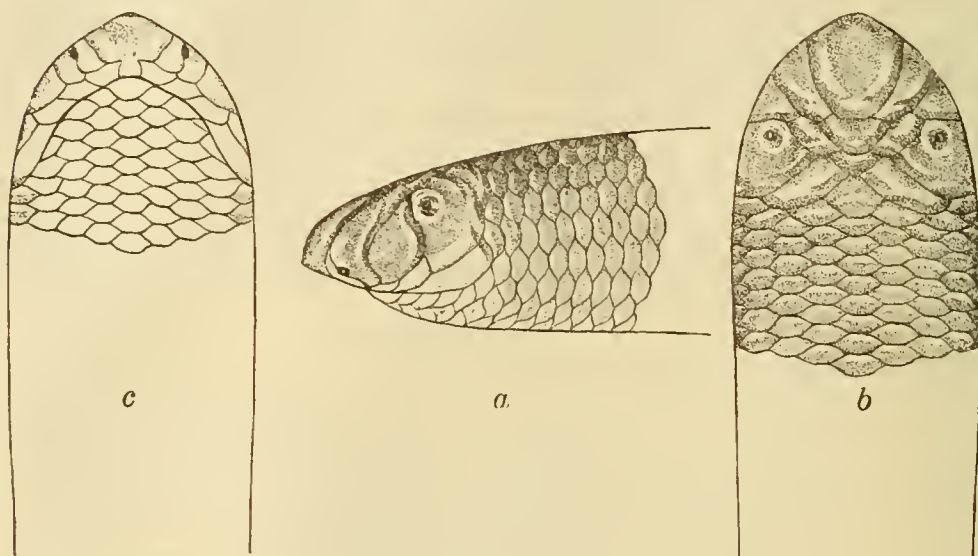


FIG. 11. *Typhlops suluensis* sp. nov.; a, side of head; b, top of head; c, underside of head.

eye; eye distinct, with a minute pupil visible, not crossed by the suture of ocular with preocular; two body scales border the ocular behind; four lower labials, the second scarcely larger than the first; scales in twenty-two rows around middle of body; twenty on neck; twenty-two in front of anus; tail ending in a sharp spine.

*Color in life.*—Above dark drab gray covering nine whole and two half rows of scales, each scale with a slightly curved lighter area, which forms a fine-meshed network over the body, balance of body very light gray, the ventral median row of scales differentiated by being much lighter in color, with the outer edges and the edges of the adjacent scale rows slightly darker; occa-

sionally an entire scale is white in the median ventral row; tip of tail and anal region whitish; underside of head rather light dirty white; head with lighter curved markings arranged regularly, following somewhat the sutures of the head scales.

*Measurements of Typhlops suluensis sp. nov.*

Total length (mm.)	340
Tail (mm.)	13
Width of tail (mm.)	5.5
Width of body (mm.)	7.4
Width of the head (mm.)	5.5
Tail width in tail length (times)	2.4
Body width in body length (times)	46
Tail length in body length (times)	26

*Remarks.*—The type was obtained on Bubuan, Tapani Group, in Sulu Archipelago. It was found in a rotten log only about 4 meters from the high-tide mark on the beach. Much effort was made to obtain other specimens on this island, but none was found. This species seems to be most closely related to *Typhlops multilineatus* and *T. olivaceus*. From the former the following differences are evident: The rostral is shorter, the nasal completely divided, the diameter of body contained in total length forty times (in *multilineatus* fifty to sixty times), twenty-two instead of twenty scales around middle of body; the prefrontal larger, the frontal smaller; the color is not arranged in longitudinal lines. From *T. olivaceus* it differs in the complete division of the nasal, the preocular much narrower than the ocular, the rostral barely half the width of the head; the color is also different.

*Python reticulatus* Schneider.

No specimen taken. Reported as being present on Tawitawi, Basilan, and Jolo, where they are said to be fairly common.

*Xenopeltis unicolor* Reinwardt.

A mutilated specimen of what is presumably this species was brought to me by a Samal, in Bongao. Most of the head is missing, but the following body characters agree largely with specimens of this rare snake from Palawan. Ventrals, 168; anal divided; subcaudals, 28; scale rows, 15; three lower labials in contact with the anterior chin-shields. Body somewhat flattened, deep blue-black above, the three lateral rows of scales white-edged; outmost row white, with dim dark dots; ventrals white; a few scattered dark spots on the posterior part of body. Underside of tail black, the scales with white edges. Length,

325 millimeters; tail, 42. Known heretofore in the Philippines only from Palawan and Balabac.

*Cyclocorus lineatus* Reinhardt.

A specimen of this common species was taken in the mountains near Zamboanga.

*Ablabes tricolor* Schlegel.

One specimen of this very rare species was taken on Bubuan Island, Tapanian Group. It was at rest in the branches of a low shrub. It agrees in remarkable detail with specimens from Palawan in regard to head scales. Ventrals, 137; anal divided; subcaudals (tip of tail missing), 103.

*Holarchus meyerinkii* Steindachner.

A single specimen of this rare snake was taken on Papahag Island, near Bongao. I regard this form specifically distinct from *Holarchus octolineatus* Schneider.<sup>11</sup> The species is also known from Tawitawi. The type locality is "Sulu Archipelago."

*Dendrophis pictus* Gmelin.

One specimen taken on Lapac; a second on Cagayan Sulu.

*Dendrelaphis modestus* Boulenger.

A single male specimen was taken on Bubuan, Tapanian Group; it agrees very well with the type description in regard to scalation of head. The dark streak on the side of the head is very dim; there is a bright orange streak along the anterior part of body (almost disappearing in alcohol); ventrals, 175; tail with tip missing.

*Elaphe erythrura* Duméril and Bibron.

Three specimens of this species were taken in Bongao. It is reported as being common there.

*Calamaria gervaisii* Duméril and Bibron.

A single specimen was collected on Cagayan Sulu.

*Psalmodynastes pulverulentus* Boie.

Two specimens were obtained from near the top of Bongao Mountain, at an elevation of 700 meters. Both were under a small log. They show very marked color variations. One is very dark with slightly lighter mottlings; the other is gray

<sup>11</sup> See *This Journal*, Sec. D (1918), 13, No. 6 (in press).



with black spots and two light streaks behind the eye along both sides of the neck, continuing for the greater part of the distance along the body.

*Crysopelea ornata* Shaw.

One specimen was obtained on Bubuan, Tapian Group; it is nearly uniform olive above, with each scale black-edged.

*Laticauda colubrina* Schneider.<sup>12</sup>

This snake was obtained on several islands. Many were observed in crevices in rocks, where they could not be readily taken; a large series was preserved.

*Doliophis philippinus* Günther.

A young specimen was taken in the mountains near Zamboanga.

#### NOTES ON ISLANDS VISITED

As most of the localities mentioned in this paper are recorded only on the Coast and Geodetic Survey chart, I append the following notes:

*Zamboanga*.—Province and town, southwest Mindanao. Collections were made in the mountains near Zamboanga, near or on the water reservation. Several specimens were also taken in the city of Zamboanga.

*Santa Cruz Islands*.—Two small, low islands lying off the coast of Mindanao about 2 kilometers from the city of Zamboanga. Covered with low brush. Few inhabitants.

*Tictauan*.—Very low, covered with dense mangrove forest; no land, very little beach, covered almost wholly with water; no inhabitants; 4 kilometers off Zamboanga.

*Basilan*.—A very large mountainous island almost entirely forested, 10 kilometers from Mindanao, separated by a channel, its greatest depth about 44 fathoms. Collections were made on the island at a point directly across from the mainland and on a rocky hill on the coast opposite Govenen Islands.

*Great and Little Govenen*.—Two islands, the first lying only a few hundred meters from the southwest coast of Basilan, the second less than a kilometer away. The first is a conical peak rising to about 200 meters, forested on top, cultivated on the

<sup>12</sup> A large sea snake, probably of this genus, but of a different species, was observed swimming on the surface of the water near Bubuan Island (Tapian Group). The waves were running rather high, and the launch was upon the reptile before it was observed. It disappeared below the surface.

sides; the smaller island is only a few meters high and contains a few hundred square meters.

*Teipono*.—A low, flat coral island, 3 kilometers off the west coast of Basilan; very small, no inhabitants.

*Tamuk*.—Somewhat larger than Teipono; forested; 4 kilometers from Basilan; a ring of low land inclosing a larger swamp about the higher interior. Greatest elevation, 60 meters.

*Cancuman*.—A small flat island lying between Tamuk and the coast of Basilan, inhabited by a few families of Samals; forested.

*Tapiantanas*.—A group of islands lying from 4 to 10 kilometers south of Basilan; consists of three mountainous islands and a large flat coral island. Collections were made on Bubuan on the western side of the island. Elevation, 264 meters; heavily forested; greatest diameter, 2 kilometers. Very few or no inhabitants. Some wild boar.

*Dipolod*.—A very small, conical, rocky island in the Samales Group. Forested; no inhabitants; 22 kilometers from Basilan.

*Mamanoc*.—A small, low, flat island; one of the Samales Group, 0.5 kilometer long.

*Bitinan*.—A mountainous island off the northeastern coast of Jolo. Forested; uninhabited; elevation, 241 meters; has many wild cattle, no wild boar.

*Jolo*.—Large, mountainous, volcanic islands second to Basilan in size in the archipelago. Separated from the Samales Group by a channel 8.5 kilometers wide and at least a hundred fathoms deep. Collections made at Siet Lake and at Crater Lake, in the central part.

*Marongas*.—A small island 5 kilometers northeast of the port of Jolo; 92 meters high; low forest or brush.

*Tulian Rock*.—Seventy meters high, 50 meters wide, 200 meters long; low brush.

*Bolipongpong*.—An island in the Northern Tapul Group, separated from Jolo by a channel about 25 fathoms deep and 17 kilometers wide. The island is 7.2 kilometers long and 4 kilometers wide; elevation, 338 meters; forested. I stopped on the extreme southwestern point.

*Lapac*.—An island 30 kilometers south of Jolo. Partly forested; largely covered with cogon fields; inhabited. Collections were made on the extreme northern coast.

*Tapaan*.—A low coral atoll, covered with brush and mangrove; uninhabited. No reptiles were seen.

*Bubuan, Tapul Group*.—A mountainous, forested island; no inhabitants; elevation, 155 meters; 3 kilometers long and about

as wide. Reptiles especially abundant; collections were made on the southern and southeastern coasts.

*Tawitawi*.—A large mountainous island, 40 kilometers long; its greatest width, 15 kilometers. Heavily forested. I collected on the extreme southern point.

*Bongao*.—A small island separated from Sangasanga by a channel a few meters wide, which affords a passage for small boats and launches. Forested; inhabited; an elevation of 330 meters. Collections were made near the town of Bongao and on the large mountain of the same name.

*Simonor*.—A rather large, low, flat island, 9.5 kilometers south of Tawitawi, separated from nearby islands by water more than 40 fathoms deep. Collections were made at the town of Tubig Indangan.

*Sibutu*.—A very long, narrow island lying southwest of Tawitawi; separated from it by Sibutu Channel, 28 kilometers wide and more than 100 fathoms deep; it is low, flat, and heavily wooded. A single small peak rising to a height of 165 meters; distant from the Bornean mainland, 29 kilometers. Collections were made on the western coast.

*Sitanki*.—A very small island surrounded by a great, shallow reef, separated from Sibutu by a deep, narrow channel; distance from the Bornean mainland, 41 kilometers.

*Sipayu*.—A very small, low sandy island separated from Tawitawi by a few hundred meters. Covered with brush and low trees.

*Sangasanga*.—A large island at the southern end of Tawitawi, separated by a channel only a few meters wide, which affords passage for barotos and vintas; forested. I collected on the southern end.





<i>Sphenomorphus variegatus</i>	X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</
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## ILLUSTRATIONS

### PLATE I

- FIGS. 1, 2, and 3. *Lepidodactylus divergens* sp. nov., from Great Govenen.  
4 and 5. *Lepidodactylus woodfordi* Boulenger, from Bubuan.  
FIG. 6. *Hemiphyllodactylus insularis* sp. nov., type, from Mindoro. Enlarged.  
7. *Hemiphyllodactylus insularis* sp. nov., from Bubuan. Enlarged.  
8. *Luperosaurus joloensis* sp. nov., type, from Jolo. Enlarged.

### PLATE II

- FIG. 1. *Draco bimaculatus* Günther, female, from Mindanao.  
2. *Draco bimaculatus* Günther, male, from Mindanao.  
3. *Draco rizali* Wandollek, female, from Simonor.  
4. *Draco rizali* Wandollek, male, from Simonor.

### PLATE III

- FIG. 1. *Dasia smaragdinum* Lesson, variety, from Great Govenen.  
2. *Dasia smaragdinum* Lesson, variety, from Mindanao.  
3. *Dasia smaragdinum* Lesson, variety, from Bongao.

### TEXT FIGURES

- FIG. 1. *Gymnodactylus annulatus* Taylor, from Sulu, preanal pores, variation.  $\times 3$ .  
2. *Gymnodactylus annulatus* Taylor, from Mindanao, preanal pores, typical.  $\times 3$ .  
3. *Luperosaurus joloensis* sp. nov., cotype from Jolo, preanal pores. About  $\times 4$ .  
4. *Hemiphyllodactylus insularis* sp. nov., type from Mindoro, preanal and femoral pores.  $\times 10$ .  
5. *Mabuya rudis* Boulenger, from Sulu; *a*, side of head; *b*, top of head.  $\times 2$ .  
6. *Sphenomorphus palustris* Taylor, from Sulu; *a*, side of head; *b*, top of head; *c*, chin.  $\times 3$ .  
7. *Sphenomorphus biparietalis* sp. nov., from Sulu; *a*, top of head; *b*, side of head.  $\times 4$ .  
8. *Riopa bowringi* Günther, from Jolo; *a*, side of head; *b*, top of head.  $\times 3$ .  
9. *Brachymeles suluensis* sp. nov., from Sulu; *a*, side of head; *b*, top of head; *c*, chin.  $\times 3$ .  
10. *Brachymeles vermis* sp. nov., from Sulu; *a*, side of head; *b*, top of head (normal); *c*, chin; *d*, top of head (variation of Papahag specimens).  
11. *Typhlops suluensis* sp. nov.; type; *a*, side of head; *b*, top of head; *c*, underside of head.

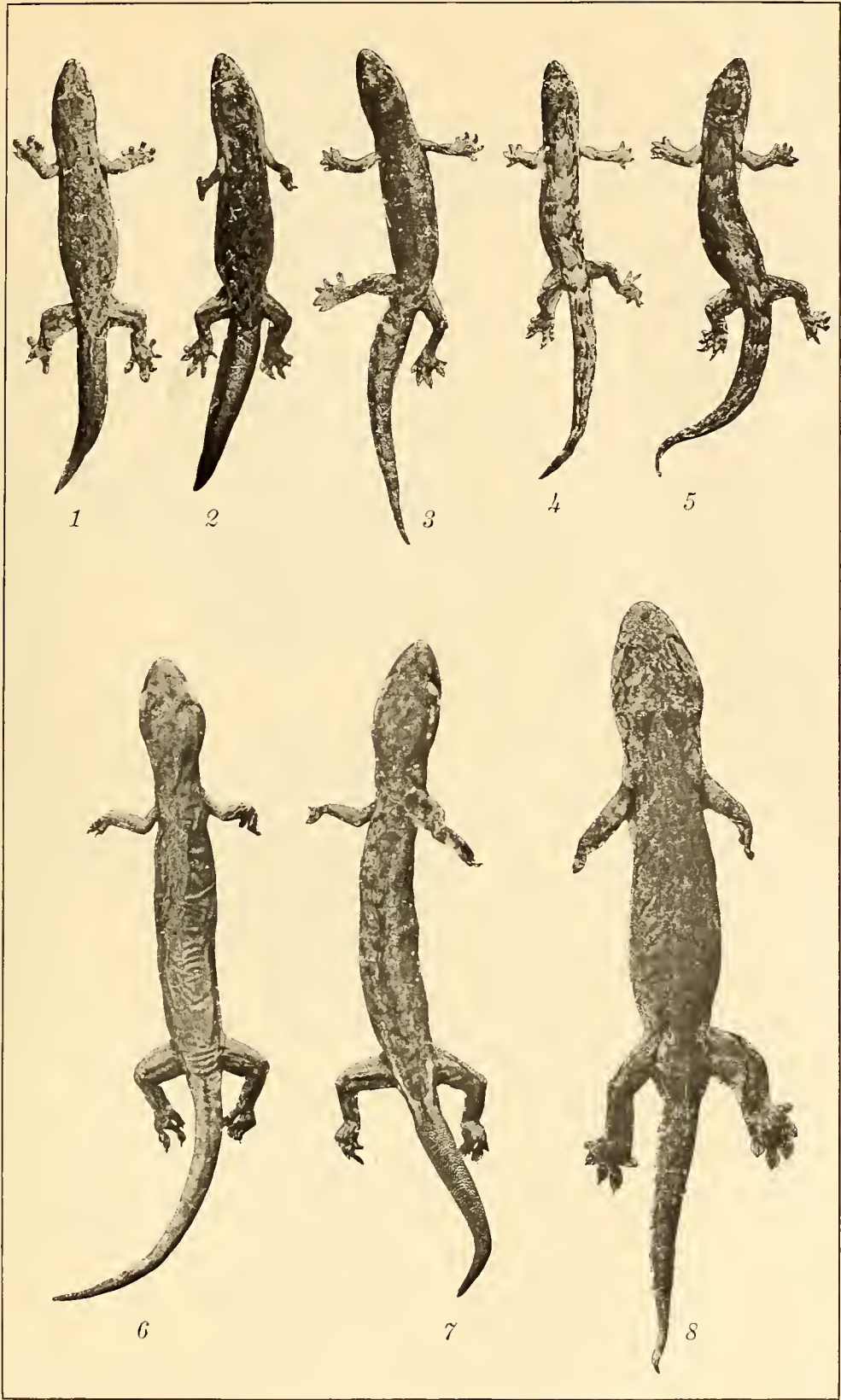


PLATE I. PHILIPPINE LIZARDS.

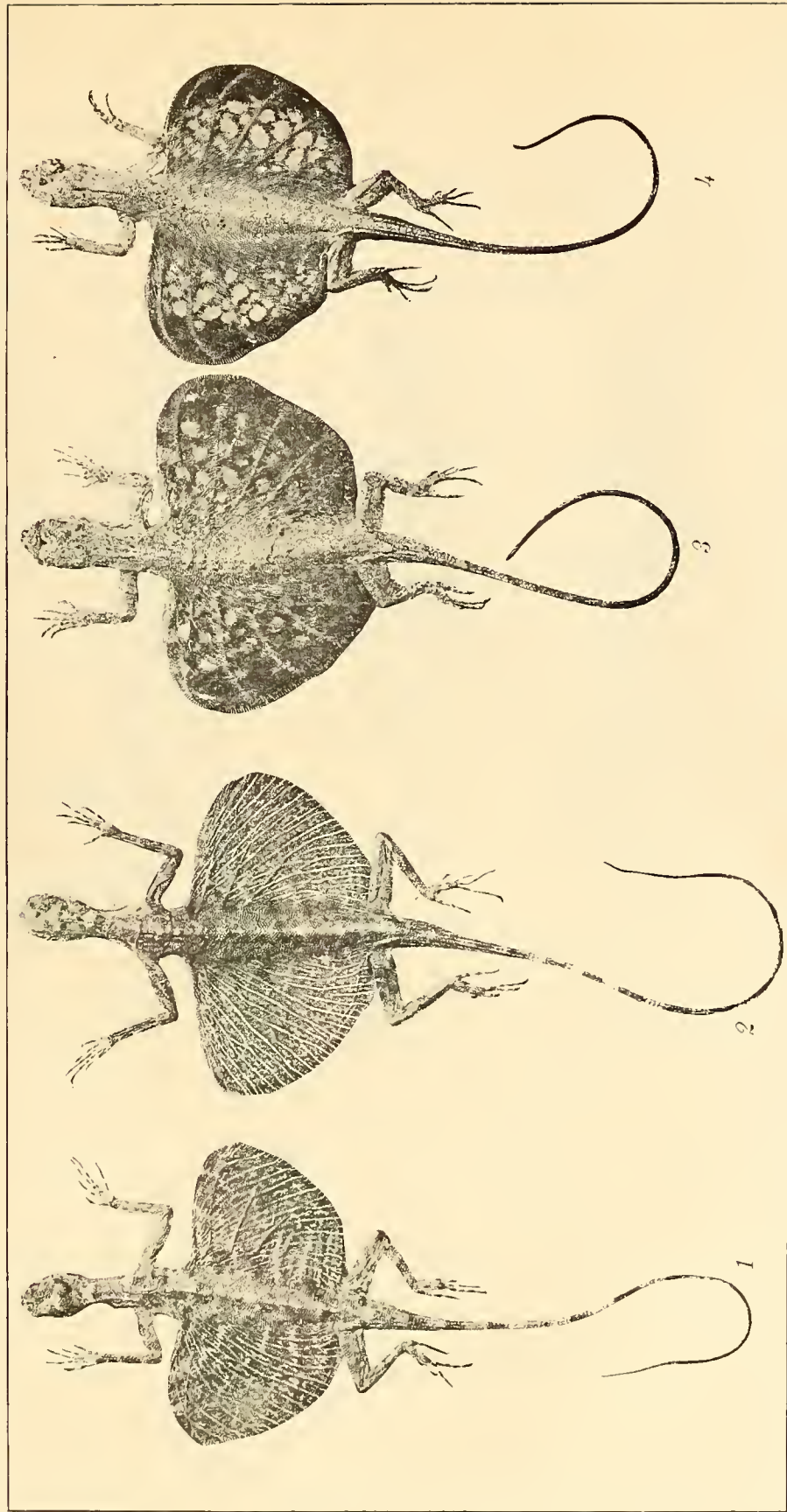


PLATE II. PHILIPPINE DRACOS.



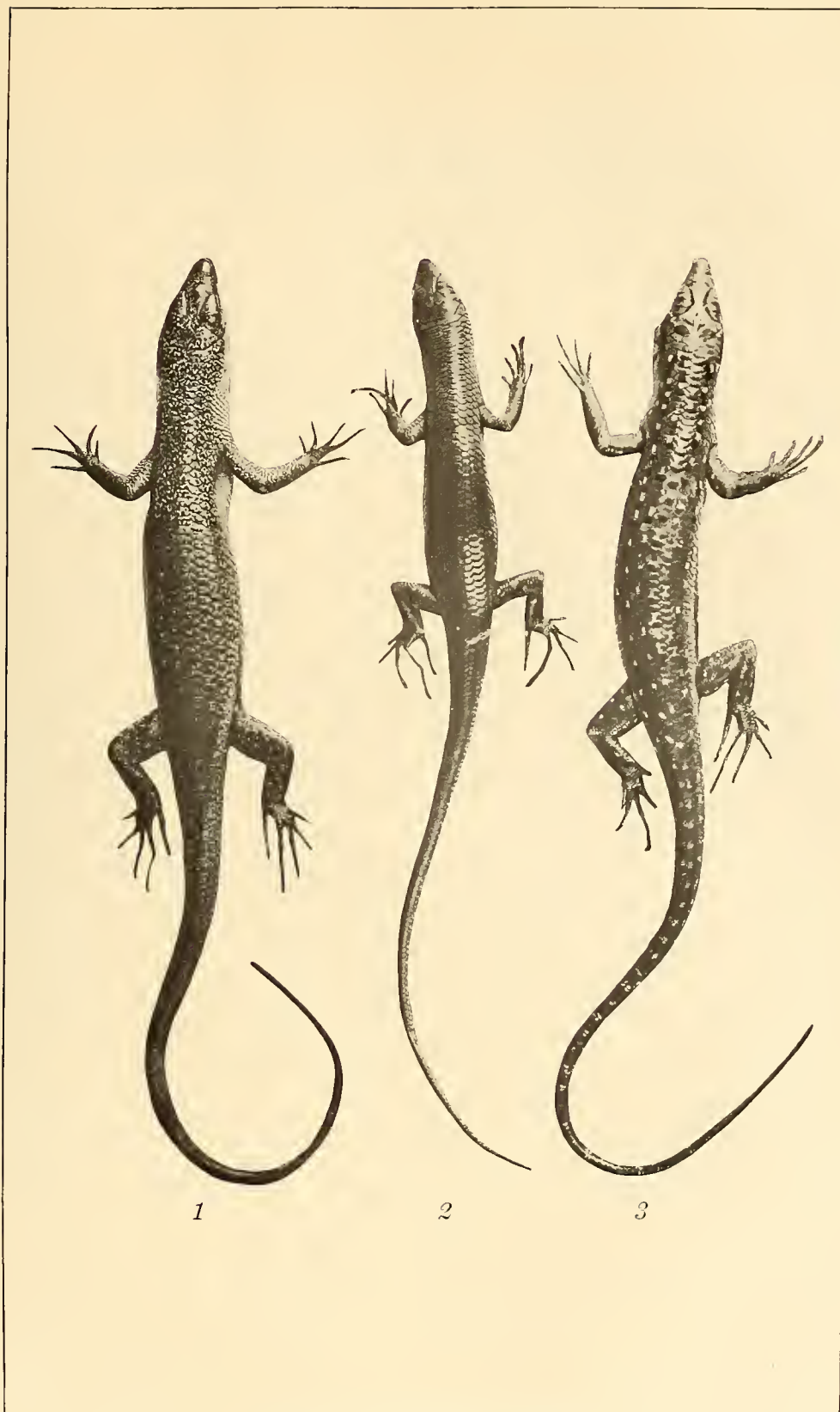


PLATE III. PHILIPPINE LIZARDS.